

AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth below. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A laser processing method of irradiating a substrate having a front face formed with a laminate part including a plurality of functional devices with laser light while locating a light-converging point of the laser light within the substrate so as to form a modified region which functions as a start point for cutting within the substrate along a cutting line of the substrate,

the method comprising:

a first forming step of forming a plurality of rows of first modified regions along the cutting line;

a second forming step of forming at least one row of a second modified region along the cutting line at a position between the first modified region closest to a rear face of the substrate and the rear face;

as a result of the second forming step, generating a fracture extending along the cutting line from the second modified region to the rear face such that the fracture does not reach the front face of the substrate;

expanding an expandable film bonded to the rear face of the substrate in a direction that is parallel to the rear face of the substrate; and

as a result of the expanding step, cutting the substrate and the laminate part along the cutting line by advancing the fracture from the substrate to the laminate part by way of the first modified regions.

Claim 2 (Original): A laser processing method according to claim 1, wherein the substrate is a semiconductor substrate, and wherein the first and second modified regions include a molten processed region.

Claim 3 (Previously Presented): A laser processing method according to claim 1, wherein the first and second modified regions are successively formed one by one from the side farther from the rear face while using the rear face as a laser light entrance surface.

Claim 4 (Previously Presented): A laser processing method according to claim 1, wherein the laser light has an energy of 2 μJ to 50 μJ when forming the first modified regions.

Claim 5 (Previously Presented): A laser processing method according to claim 1, wherein the laser light has an energy of 1 μJ to 20 μJ when forming the second modified region.

Claim 6 (Previously Presented): A laser processing method according to claim 1, wherein the laser light has a greater energy when forming the first modified regions than when forming the second modified region.

Claim 7 (Previously Presented): A laser processing method according to claim 6, wherein the energy of the laser light for forming the first modified regions is 1.6 to 3.0 times as large as the energy of the laser light for forming the second modified region.

Claim 8 (Previously Presented): A laser processing method according to claim 1, wherein respective positions where the light-converging point of the laser light is located when forming neighboring first modified regions have a distance of 24 μm to 70 μm therebetween.

Claim 9 (Previously Presented): A laser processing method according to claim 1, wherein the light-converging point of the laser light is located at a position distanced by 50 μm to [(the substrate thickness) \times 0.9] μm from the rear face when forming the first modified regions.

Claim 10 (Previously Presented): A laser processing method according to claim 1, wherein the light-converging point of the laser light is located at a position distanced by 20 μm to 110 μm from the rear face when forming the second modified region.

Claim 11 (Original): A laser processing method according to claim 1, wherein, when forming a plurality of rows of second modified regions, the laser light has a greater energy when forming the first modified regions than when forming the second modified region closest to the rear face of the substrate.

Claim 12 (Currently Amended): A laser processing method according to claim 11, wherein, when forming a plurality of rows of second modified regions, the energy of the laser light for forming the second modified region farthest from the rear face of the substrate is set at a ratio 1.3 to 3.3 as compared to, ~~where~~ the energy of the laser light for forming the second modified region closest to the rear face of the substrate ~~is taken as 1~~.

Claim 13 (Currently Amended): A laser processing method according to claim 11, wherein, when forming a plurality of rows of second modified regions, the energy of the laser light for forming the first modified regions is set at a ratio 1.3 to 3.3, ~~where as compared to the~~ energy of the laser light for forming the second modified region closest to the rear face of the substrate ~~is taken as 1~~.

Claim 14 (Original): A laser processing method according to claim 1, wherein, when forming a plurality of rows of second modified regions, a position where the light-converging point of the laser light is located when forming the second modified region closest to the rear face of the substrate is distanced from the rear face by 20 μm to 110 μm , and a position where the light-converging point of the laser light is located when forming the second modified region second closest to the rear face of the substrate is distanced from the rear face by 140 μm or less.

Claim 15 (Previously Presented): A laser processing method according to claim 1, further comprising the step of cutting the substrate and laminate part along the line to cut.

Claim 16 (Withdrawn): A semiconductor chip comprising a substrate; and a laminate part, disposed on a front face of the substrate, including a functional device;

wherein a plurality of rows of first modified regions extending along a rear face of the substrate are formed in a side face of the substrate so as to be in series in a thickness direction of the substrate; and

wherein at least one row of a second modified region extending along the rear face is formed at a position between the first modified region closest to the rear face and the rear face in the side face.

Claim 17 (Withdrawn): A semiconductor chip according to claim 16, wherein the substrate is a semiconductor substrate, and wherein the first and second modified regions include a molten processed region.

Claim 18 (Withdrawn): A semiconductor chip according to claim 16, wherein an end part of the first modified region on the rear face side and an end part of the second modified region on the front face side opposing each other have a distance of 15 μm to 60 μm there between.

Claim 19 (Withdrawn): A semiconductor chip according to claim 16, wherein the first modified regions have a total width of 40 μm to [(the substrate thickness) \times 0.9] μm in the thickness direction of the substrate.